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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/706,472	11/10/2003	Thomas James Batzinger	RD-28,303-1	6737

6147 7590 07/20/2006

GENERAL ELECTRIC COMPANY  
GLOBAL RESEARCH  
PATENT DOCKET RM. BLDG. K1-4A59  
NISKAYUNA, NY 12309

EXAMINER

SMITH, NICHOLAS A

ART UNIT PAPER NUMBER

1742

DATE MAILED: 07/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

5

<b>Office Action Summary</b>	Application No. 10/706,472	Applicant(s) BATZINGER ET AL.	
	Examiner Nicholas A. Smith	Art Unit 1742	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 10 November 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) 22-31 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 22-31 are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>11/10/03, 11/14/05</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Election/Restrictions***

Applicant's election without traverse of claims 1-21 in the reply filed on 6/12/2006 is acknowledged.

### **Status of Claims**

Elected claims 1-21 remain for examination. Unelected claims 22-31 are withdrawn from consideration.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-2, 8, 10-12, 15, 18 and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Li et al. (US Patent 6,355,156) as submitted by applicant in information disclosure statement on 11/10/2003.

In regards to claims 1 and 12, Li et al. discloses a method of monitoring machining in an electrochemical machining tool assembly (Figure 1) having at least one electrode (**12**) arranged across a gap from workpiece (**16**), the electrode being energized by application of a potential difference (**20**), exciting at least one ultrasonic sensor to direct an ultrasonic wave toward a surface of the electrode and receiving a reflected ultrasonic wave from the surface of the electrode using the ultrasonic sensor,

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the reflected ultrasonic wave comprising a plurality of reflected waves from the surface of the electrode and from a surface of the workpiece (col. 2, lines 38-43).

However, Li et al. does not specifically disclose delaying the excitation of the ultrasonic sensor a dwell time after a reduction of the potential difference or in the transition from a pulse-on to a pulse-off state across the electrode and the workpiece occurs. Li et al. does teach reducing the potential difference or using pulsed power supply so as to minimize the generation of gas bubbles in order for a more accurate measurement to be made (col. 5, lines 40-45). Since the measurement using the ultrasonic sensor is made after generation of gas bubbles is lessened by a decrease in potential difference or in the pulse-off state of a pulsed power supply, there is an inherent delay (i.e., a dwell time) between the decrease in DC voltage and measurement made by ultrasonic sensor due to the inherent time it takes to transmit electronic signals. Therefore, a dwell time would be inherent to the method disclosed by Li et al.

In regards to claim 15, Li et al. discloses the features that are the same as in claim 1 for the same reason as above. Li et al. discloses the features of flowing electrolyte (18) through and flushing electrolyte (18) from the gap (26) using a pump system (col. 3, lines 62-67 and col. 4, lines 1-3). Li et al. also discloses feeding at least one electrode toward the workpiece (col. 3, lines 54-55).

In regards to claims 2 and 18, Li et al. discloses a method of using pulsed electrochemical machining (col. 5, lines 40-45).

In regards to claim 8, Li et al. discloses at least two electrodes each being arranged across a respective gap from the workpiece (Figure 1).

In regards to claims 10 and 20, Li et al. teaches a method of analyzing ultrasonic sensor signals to determine the size of the gap between the electrode and the workpiece (col. 4, lines 43-57).

In regards to claim 11, Li et al. teaches an ultrasonic transducer (col. 5, lines 17-21).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 3-7, 13-14, 16-17 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li et al. in view of Klocke et al. (US 2003/0079989).

In regards to claims 3 and 19, Li et al. does not specifically teach repeating reducing the potential difference across the electrode and the workpiece or using a pulsed power supply to generate a series of measurement periods. Since reducing the potential difference or being in a pulse-off state minimizes the generation of bubbles (col.5, lines 40-45), which consequently improves the accuracy of measurement, it would have been obvious to one of ordinary skill in the art to make multiple measurements in order to improve the accuracy of the measurement, especially

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considering that accuracy improves as potential difference is reduced or is in a pulse-off state.

In regards to claim 4-7, 13-14 and 16-17, Li et al. does not teach choosing a dwell time in the claimed range nor adjusting the dwell time in said method.

Klocke et al. teaches that when a pulsed electrochemical process is in its interrupted phase bubbles will that would inherently evolve will no longer evolve (paragraph [0076]). Also, impinging flow of electrolyte in a gas control system is employed to reduce bubble evolution (paragraph [0077]) as is employed in the instant application. These methods, alone or in combination, or in combination with other bubble reduction methods, shall be used to bring about the desired result of degree of bubble reduction (paragraph [0077]). While bubble reduction is not the claimed parameter in claims 4-7, one of ordinary skill would realize that dwell time is directly related to bubble minimization, in that, the longer the electrode is not energized, the more time there is for impinging flow to clear the electrode surface of bubbles to allow an accurate measurement. It would have been obvious to one of ordinary skill in the art at the time of invention to optimize bubble reduction as taught by Klocke et al. in Li et al.'s method as Klocke et al. teaches that bubble reduction is a results-effective variable of several gas control methods (Klocke et al., paragraph [0077]). See MPEP 2144.05 II.

Claims 9 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li et al. in view of Raulerson et al. (US Patent 5,671,2263) as submitted by applicant in information disclosure statement on 11/10/2003.

In regards to claim 9, Li et al. does not teach the use of at least two ultrasonic sensors, the second ultrasonic delaying the excitation by a dwell time plus an offset of at least the time required to attenuate the ultrasonic wave from the first ultrasonic sensor.

Raulerson et al. teaches the use of two or more ultrasonic sensors (32) (col. 5, lines 3-6) for measurement of gap distances in an electrochemical machining method. It would have been obvious to one of ordinary skill in the art to apply the Raulerson et al.'s method of using two or more ultrasonic sensors in Li et al.'s method in order to perform process monitoring and thus avoid over-machining of the workpiece (Raulerson et al., col. 5, lines 9-12). Including an offset time between ultrasonic sensor signal excitation is a necessary adjustment inherent to a control system employing multiple emitting/receiving sensors in order to avoid attenuation or interference.

In regards to claim 21, Raulerson et al. is applied to the claims for the same reasons as stated above.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nicholas A. Smith whose telephone number is (571)-272-8760. The examiner can normally be reached on 8:30 AM to 5:00 PM, Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571)-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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